Notes.

THE French Association for the Advancement of Science is meeting this week at Rouen under the presidency of M. Rateau. The scientific proceedings of the association will be carried on in twenty-two sections and sub-sections. There will be two lectures—one on the synthesis of ammonia by M. G. Claude, and the other on aviation of to-day and in the future by M. Bréguet.

THE council of the Museums Association has elected Mr. T. Sheppard, of the Municipal Museums, Hull, as president of the association for 1922–23.

DR. D. SEGALLER, who has been with the British Dyestuffs Corporation, Ltd., since the firm of Messrs. Read Holliday and Sons was acquired by British Dyes, Ltd., is severing his connection with the Corporation. As head of the technical department he has been in charge of a staff of chemists engaged on research on various problems connected with the activities of the Corporation.

A DESCRIPTION of ball lightning seen in the sky at St. John's Wood during a thunderstorm in the early morning of June 26 has recently been received at the Meteorological Office. The phenomenon, a large incandescent mass floating in the air below the clouds and apparently stationary for some minutes, is of great rarity, and the Director of the Meteorological Office, London, S.W.7, would be greatly obliged if persons who observed it on this occasion would communicate with him. Prof. I. Galli has brought together a number of observations of globular lightning recorded in classical literature, as well as many from modern scientific publications, and has described them in several papers issued by the Portificia Accademia dei Nuovi Lincei of Rome.

IN consequence of the retirement of Sir Hercules Read, the department of the British Museum hitherto known as the Department of British and Medieval Antiquities and Ethnography has been divided, and the following appointments have been made by the principal trustees:—Mr. O. M. Dalton to be Keeper of the Department of British and Medieval Antiquities; Mr. R. L. Hobson to be Keeper of the Department of Ceramics and Ethnography; Mr. T. A. Joyce to be Deputy-Keeper in the Department of Ceramics and Ethnography. Mr. Reginald Smith, hitherto Deputy-Keeper in the undivided department, becomes Deputy-Keeper in the Department of British and Medieval Antiquities. The prehistoric collections fall into the Department of British and Medieval Antiquities, and the Oriental collections into that of Ceramics and Ethnography.

ON Thursday, July 21, a memorial was unveiled in the public gardens at Dartmouth to the memory of Thomas Newcomen, the great pioneer of the steam engine. Newcomen was born in Dartmouth in 1663; he followed the trade of blacksmith there, and was also a Baptist preacher. He appears to have been associated with Thomas Savery in his work on the use of steam, but to Newcomen belongs the credit of developing the cylinder and piston steam engine, the first one being erected near Dudley Castle in 1712. By 1716 similar engines were at work in Staffordshire, Warwickshire, Cornwall, and Flintshire, and the engine had no rival until the time of Watt. One or two Newcomen engines were at work until the beginning of the present century. During the latter part of his life Newcomen lived in London, and he died there on August 5, 1729. He was buried in the Bunhill Fields burying-ground. The memorial at Dartmouth consists of two engraved brass tablets mounted on a large rough granite block. After the memorial had been unveiled by the Mayoress, Mrs. C. Peek, a wreath was placed upon it as a tribute from the Newcomen Society, which was formed last year to further the study of the history of engineering and technology.

COL. HOWARD BURY's latest dispatch from the Mount Everest expedition to the *Times* is dated from Tingri Dzong on June 26. It describes the fortunes of the expedition during the march from the Arun Valley up the valley of the Bhong. On the way a visit was paid to Shekai Dzong, an important administrative centre and the site of a large monastery. Major Morshead and his surveyors have already mapped some 25,000 square miles of new country along the route of the expedition. Rinderpest in the Bhong Valley necessitated the use of donkeys only for transport, but they proved quite satisfactory. Tingri Dzong, which is to be the main base of the expedition, is forty-four miles in a direct line from Mount Everest, which rises gradually from the plain of Tingri Maidan without any intervening ridges. Some six weeks will be spent at Tingri and its neighbourhood in reconnoitring the slopes, and the expedition will then move to Kharta to spend another six weeks examining the valleys on the east and north-east of Mount Everest. Mr. A. F. R. Wollaston has rejoined the expedition after accompanying Mr. Raeburn back to Sikkim, and later will visit the neighbourhood of Gosainthan for botanical researches. Col. Bury says that the western slopes of Mount Everest appear to be very much steeper than had been anticipated, but he believes that the east and north-east slopes present the fewest difficulties. The weather was cloudy, and the expedition was getting few distant views.

THE first technical session of the International Commission on Illumination, the successor of the International Photometric Commission, was held in Paris on July 4–8. Those interested in illumination problems in Belgium, France, Great Britain, Italy, Spain, Switzerland, and the United States of America were represented at the session, which was opened by the Minister of Public Works, who welcomed the delegates in the name of the French Republic. The British delegates, nominated by the National Illumination Committee of Great Britain, were:—Major K. Edgcumbe (Institution of Electrical Engineers, chairman of the National Committee), Mr. C. C. Paterson (hon. secretary and treasurer of the International Commission), Mr. A. P. Trotter (Illuminating Engineering Society), Dr. E. H. Rayner (National Physical Laboratory), Mr. L. Gaster (Illuminating Engineering Society), Mr. R. Watson (Institution of Gas Engineers), and Mr. J. W. T. Walsh (National Physical Laboratory, assistant secretary of the International Commission). The subjects dealt with by the Commission were as follows:—(1) The unit of candle-power at present in use in this country and in France and the United States was adopted for international purposes, and is to be known as the "international candle." It is maintained by means of electric incandescent lamps at the National Laboratories of the three countries named. (2) The definitions of the terms "luminous flux," "luminous intensity," and "illumination," and the units of these quantities, viz. the lumen, the candle, and the lux (metre-candle), were agreed upon. (3) The subjects of heterochromatic photometry (including physical photometry and the characteristics of the "normal eye"), factory lighting, and automobile head-lighting were also discussed at the meetings, and sub-committees were appointed to study the questions from the international point of view during the next three years. The new president of the Commission is Dr. E. P. Hyde, director of the Nela Research Laboratories of America, and Major Edgcumbe is one of the three vice-presidents. The next meeting of the Commission was provisionally arranged to be held in New York in 1924.

CORRESPONDENCE has recently appeared in the *Times* on the subject of State awards for medical discovery. Sir Ronald Ross urges (July 13) that a system of small pensions, somewhat on the lines of Civil List pensions, ought to be established in order to compensate medical men and others for work which has been of advantage to the public without being remunerative to themselves, the medical profession rightly objecting to medical discoveries or inventions being kept secret or monopolised by those who make them. Sir Ronald Ross mentions an example:—Dr. H. made during the war valuable additions to our methods of diagnosis by X-rays, particularly by the use of a cardboard scale. He appealed to the Royal Commission on Awards to Inventors, but was refused an award on the ground that the chairman had "such a high esteem of the noble ideals which the medical profession had adopted in forgoing personal advantage, giving their services free, and so on, that he was in favour of maintaining this spirit, and altogether against the idea that the Royal Commission could be persuaded to give an award to a member of the medical profession." This means, as Sir Ronald Ross pertinently remarks, that while the inventors of life-destroying devices may be rewarded by the State, those of life-saving devices are to be rigorously excluded! To this Mr. Tindal-Robertson, Secretary of the Royal Commission on Awards, replied (July 15), quoting the general practice of the Commission, and stating that in the particular case of Dr. H. the ordinary principle was held to apply, that the sale of any article, whether patented or copyrighted or not, necessarily includes the right to use the article. Sir Ronald Ross replied to this letter (July 28), admitting that the Royal Commission, on the grounds laid down, could not help, but urging that the powers of the Royal Commission should be enlarged so as to enable it to deal with the claims in question. He quoted the precedent of Edward Jenner, who received a grant of 30,000*l.* from the State. It is noteworthy that the British Science Guild and the British Medical Association last year advocated the payment of pensions on the lines suggested by Sir Ronald Ross, and that the latter body reaffirmed the principle at its annual meeting in July.

RECENT excavations at Pompeii, which have been in progress since 1911, have disclosed what may one day prove to be the most interesting part of the city, but the results are still jealously concealed from the visitor. A correspondent of the *Times* of July 26 is, however, in a position to supply some information regarding them. Passing through the well-known Strada dell' Abondanza, a compitum or crossing of two streets is reached, where there is a large sacred picture. Such places were held sacred, and were generally marked with sacred pictures and an altar, where propitiatory sacrifices were made to the Lares, who had houses and street-crossings under their special protection. The fresco now unearthed is divided into three sections, the first representing the twelve Penates or city guardians, beginning with Jupiter and Juno and ending with Diana. To the right of this painting, which is probably more interesting than any other found at Pompeii except that of the Villa Dionysius, is a sacrificial scene in which a large-winged demon serpent, the emblem of the Lares, is seen approaching the altar with two eggs and a pine cone as a bribe to it to avert the Evil Eye. Beneath is a real altar of masonry, on which are still preserved the ashes of the last sacrifice that was offered before the fatal August 24, A.D. 79. Archæologists will await with much interest the publication of these important discoveries.

IN a communication to the Ipswich and District Field Club Mr. Reid Moir describes the excavation of several barrows (sepulchral mounds) on Brightwell Heath, near Ipswich. Within a radius of 8 ft. in the middle of one, on the original ground-level, were found fragments of a pottery beaker dating from the early Bronze age and a number of flint scrapers and other implements, which the author claims to be able to distinguish from Stone-age specimens by an examination of their flaked areas. The study has hitherto been complicated by the habit of collecting *all* the worked flints from a barrow, whether belonging to a burial or scattered at random in the soil thrown up to form the mound, and possibly of much earlier date. Full-size drawings are given, with side-views and an analytical table of the 152 scrapers and 106 flakes found. Another barrow contained a burial of the earliest Anglian period, about A.D. 460, with a thin bronze bowl containing the cremated bones and originally covered with linen secured by a cord under the rim; also a bone comb and ornamented bone disc closely resembling those found at Felixstowe, and now in the British Museum. The bronze bowl further contained part of an ivory armlet, two glass beads, and a clay draughtsman. Altogether an exceptional find that opens up a prospect of further successes on the Suffolk heaths.

MR. E. E. GREEN contributes to the July issue of the *Entomologist's Monthly Magazine* part vi. of his "Observations on British Coccidæ." In the present article three species of Eriococcus are described as new to science. *E. glyceriae* is based upon specimens obtained from *Glyceria maritima* growing at Blakeney Point, Norfolk; *E. placidus* was obtained from a species of grass (? Festuca) at Thurnham, Kent; and the third new species, *E. pseudinsignis,* occurred on a similar food-plant in the same locality. Mr. Green has added much to our knowledge of British scale-insects during the past few years as the result of painstaking field observations. Although the family includes some of the most destructive of all insects, the British forms, excepting the common mussel scale and a few other kinds, are seldom observed unless by the trained specialist. In the same periodical Mr. J. E. Collin continues his descriptive keys of Anthomyid flies of the genus Limnophora, Desv., inhabiting our islands.

AN interesting article on the biology and genetics of the very common ladybird beetle, *Adalia bipunctata,* is contributed by Mrs. O. A. M. Hawkes to the Proceedings of the Zoological Society for December, 1920. It is found that, although this beneficial insect will devour many species of aphids, it will not, for example, eat the common bean aphis except under stress of circumstances. Difficulties were experienced in the rearing of this and other species of ladybirds in captivity owing to their cannibalistic habit of devouring their eggs, larvæ, and pupæ. *A. bipunctata* has many colour forms, and these varieties offer suitable material for the study of inheritance of normally occurring variations. There is no evidence of dominance in crosses between its two chief forms, the red and the black, but matings of red with red produced only red with two exceptions. In matings of black with black both red and black forms resulted, but it was not possible to guarantee that the females had not had partners prior to the experimental tests.

AMONG the many activities of the late Mr. W. Denison Roebuck, of Leeds, none was pursued with greater determination than the collection of records of the distribution of land and fresh-water mollusca in the British Isles. Beginning in 1877, he was still adding fresh data up to his death in 1919, and the summary results of the 59,000 entries in his books are published in the last issue of the *Journal of Conchology* (vol. xvi., No. 6). No record was admitted to his "census" unless specimens had been seen and verified by referees appointed by the Conchological Society. The distributions ascertained by this accurate and painstaking work are set out in tables under 153 topographical divisions based on those devised by H. C. Watson, and are also shown for more than 150 species in five plates of small, but clear, maps. The whole forms an account which should be of substantial value not only to conchologists, but also to students of geographical distribution. It is to be hoped that its publication will stimulate naturalists to deal with other groups in the same way, and by collaboration render the enormous mass of data which must exist in individual collections of more general service. British entomology suggests itself particularly as a field in which important results might readily be obtained by systematised effort. Copies of Mr. Roebuck's work may be had from Mr. J. W. Jackson, University Museum, Manchester, at 5s. each.

A MEMORANDUM to the Government of India regarding the probable amount of monsoon rainfall in 1921 was issued by Dr. Gilbert T. Walker, Director-General of Observatories in India, dated June 7, 1921. The monsoon rainfall is affected by previous conditions over different parts of the earth, and these conditions have been on the present occasion unusually divergent. In India the development of the monsoon on the western side of the Peninsula had up to date been less vigorous than usual. Examining one of the features of interest, it is shown that scarcely any snow fell during the preceding winter in Baluchistan and very little on most of the hills of the North-West Frontier Province. The total winter precipitation over these areas is said to be the lowest for at least twenty years. Dr. Walker summarises the conclusions to be drawn from the controlling features with a statement that it would be unjustifiable to attach any importance to indications so feebly marked as those of the present year, and he adds that when their resultant effect is so trifling nothing is gained by attempting to reach a conclusion, and he does not consider the controlling factors decided enough to enable a trustworthy forecast to be prepared.

So far as efficiency and durability are concerned, there does not seem much to choose between the electrical and the mechanical methods of connecting the propellers of a ship with the steam turbines. Excellent results have been obtained by both methods. The electrical method, however, has much greater flexibility. There is no necessity to have the turbines near the shaft, and its direction of rotation can be reversed with the greatest ease. In *La Nature* for July 16 L. Jauch, the chief mechanician of the French Navy, compares the two methods, and concludes that the electrical drive will be much the more popular in the future. He points out that five battle-cruisers each requiring 180,000 h.p. and using electrical methods of driving the propeller are being built in America. The author calculates that at maximum power the efficiency of the mechanical type of gearing would be 2 per cent. higher. But this is offset by a 2 per cent. gain in favour of the electric drive at mean speeds and a 20 per cent. gain at low speeds. He points out that with the electric drive there is no fixed relation between the speed of the propeller and the speed of the steam turbine. Hence the latter can always be run near the speed at which its efficiency is a maximum.

THE Department of Commerce, Bureau of Standards, Washington, has just issued Circular Paper No. 100 on "Nickel" (20 cents). This is one of a series describing the physical properties of metals, together with a discussion of the relation of these properties to the composition and treatment of the materials. In it are described the properties of nickel and of its commercially important alloys: nickel-steel, ferro-nickel, copper-nickel, and nickel-chromium alloys. The pamphlet is illustrated by numerous photomicrographs and curves, and provided with a very complete bibliography. The collection of data will be valuable to metallurgists.

THE Wireless Press, Ltd., announces for early publication a volume by Prof. J. A. Fleming, who was recently awarded the Albert medal of the Royal Society of Arts in recognition of his many valuable contributions to electrical science. Under the title "Fifty Years of Electricity: The Memories of an Electrical Engineer," the work will record the progress of electrical engineering since 1870, the year in which Prof. Fleming attained his majority.

THE catalogue of optical instruments recently issued by Messrs. Adam Hilger, Ltd., 75A Camden Road, London, N.W.1, contains details of a number of instruments not previously obtainable in this country. Amongst them may be noted a monochromatic illuminator, an infra-red spectrometer, a vacuum spectrograph, a linear thermopile, a spectrophotometer, and several refractometers. Messrs. Hilger are offering a limited number of their instruments at a special reduction of 20 per cent. off their current prices.

ERRATUM.—We regret that the price of the fifth edition of Sir J. J. Thomson's "Elements of the Mathematical Theory of Electricity and Magnetism" was incorrectly given in NATURE of July 21, p. 647, as 30*s.* net instead of 25*s.* net.

Our Astronomical Column.

DISPLACEMENT OF LINES IN THE SPECTRUM OF VENUS.—The *Astrophys. Journ.* for June contains a paper by Dr. Chas. E. St. John and Mr. Seth B. Nicholson, in which they test the result announced by Mr. Evershed that his Venus spectrograms supported the view that the earth exerts a repulsive effect on the solar gases, analogous to that which the sun appears to exert on comets' tails. The authors took two series of Venus spectrograms: in 1919 with Venus east of the sun, and in 1919–20 with Venus west of the sun. Their analysis of the results leads them to conclude that the effect can be correlated with the altitude and the angular diameter of Venus; hence they conjecture that it is due to atmospheric dispersion, the centre of the visual image which was adjusted on the slit differing from the centre of the photographic image. They propose in future to take some further plates viewing the image through a blue screen, which should eliminate the above source of error. They have incidentally examined the measures to see if they afford any evidence of a rapid rotation of the planet, but conclude that "the difference between the morning and evening series . . . is not of an order that would indicate . . . a rate of rotation higher than that found by Slipher." In all the plates of the series, whether on Venus, the sky, or the sun, an iron-arc spectrum was photographed simultaneously.

PLANETARY PHOTOGRAPHY.—Pubns. Ast. Soc. Pacific, June, 1921, contains a lecture by Mr. E. C. Slipher on this subject, illustrated by numerous reproductions of photographs of Venus, Mars, Jupiter, and Saturn. Those of Venus failed to record any surface markings, but illustrate the changes of diameter and phase that occur in the synodic period. The photographs of Mars taken at Flagstaff are stated to number 100,000. Numerous exposures are made on each plate, in the hope that some will catch the moments of best definition. Mr. Slipher gives a long list of features that he claims can be verified from the plates. It must, however, be admitted that not all of these can be seen on the reproductions, though they may be visible on the original negatives. The polar cap is shown with great clearness, and it would seem to be worth while to make measures of its position angle in order to obtain an independent determination of the position of the axis.

The photographs of Saturn yield much interesting information. The great excess of luminosity of ring B over ring A, and the semi-transparency of the latter, permitting the outline of the ball to be seen through it, are well brought out; also the faintness of the ring when the sun is near its plane. There are reproductions of two exposures on April 28 last, when the earth and sun were on opposite sides of the ring-plane. There is a dark stripe across the centre of the disc, formed by the dark side of the ring and its shadow; it is narrowest in the middle, the two edges being curved in opposite directions. One feature shown in all the photographs is the extreme regularity of the fivefold belt in Saturn's southern hemisphere. The edges appear to be exactly parallel to the equator. One is inclined to mistrust this regularity on drawings, but the photographs are free from bias.

MEASUREMENT OF THE DIAMETER OF ARCTURUS.—Mr. F. G. Pease (Pubns. Ast. Soc. Pacific, June, 1921) gives an account of the work with the interferometer on the 100-in. Hooker telescope at Mount Wilson since the successful measurement of the diameter of Betelgeuse. Observations on Arcturus in February and March, with poor seeing, showed some diminution of the visibility of the fringes with increasing distance between mirrors. At length on April 15 the seeing was perfect, and the fringes were found to disappear when the mirrors were separated by 19·5 ft. As the maximum separation at present is 20 ft., it was not possible to proceed to the next point of greatest visibility of fringes; but the value 19·5 is considered to be correct within 0·5. Assuming an effective wavelength for type Ko as 5600, the angular diameter of Arcturus is 0·0237″, very near the mean of the values estimated by Eddington, Russell, and Hertzsprung. The parallax is taken as 0·116″ from the mean of the best recent measures, giving a linear diameter of 19,000,000 miles, or twenty-two times that of the sun.

Observations of Aldebaran on nights of poor definition give grounds for thinking that its angular diameter is somewhat greater than that of Arcturus; Pollux and α Ceti give indications of weakened fringes, but probably a longer beam than 20 ft. would be needed to make them disappear. The mirrors have hitherto been moved by hand, which has taken much time. Two screws driven by a single motor are now being mounted, which should greatly facilitate the measures.